10/23

Do now:
Read pp. 122-123

A minimum of half of the group members must change from Chapter 1 to Chapter 2. Each group must contain five members. 10/23

Group 1	Group 2	Group 3	Group 4
Rachelle	Gabby	Alexandra	Mia
Cinthia	Vicky	Marina	Elizabeth
Alejandra L.	Alejandra R.	Daisy	Azusena
Zuleima	Lindsay	Stacey	Sandra
Rubi	Izamar	Meghan	Shelby

Chapter 2: Physics in Action 10/23

Chapter Challenge p.128

pick a sport find video (2-3 min)

describe the physics of the action

record audio or Live

15 written script

10 entertaining/interesting

20 physics terms (explained) (≥ 4)

20 p.t. (used properly)

15 Video (2-3 min)

These groups were chosen on Tuesday, October 23, by those students present in class.

Group 1	Group 2	Group 3	Group 4
Rachelle	Gabby	Alexandra	Mia
Cinthia	Vicky	Marina	Elizabeth
Alejandra L.	Alejandra R.	Daisy	Azusena
Zuleima	Lindsay	Stacey	Sandra
Rubi	Izamar	Meghan	Shelby

These are your groups for the duration of Chapter 2 unless a team loses multiple members due to withdrawal from FCHS.

2.1: Newton's First Law: A Running Start p.132 10/30/12

WDYS

Running boy (ALL into IT) kicked ball really far
Standing boy didn't kick near as far
Little bug not succeeding at pushing ball
Mouse didn't kick ball far enough so it didn't
roll back + hit him
Dog is bored, watching standing boy

WDYT

ICESKATER
friction, heat melt a groove into ice
cut groove
gravity helps skate cut ice
ice is slippery
weight

Soccer ball
round, rolls easily
force of kick keeps working
no objects in the way
slippery grass
running start for kicker
flat or down hill

light, full of air
pumped up
deeper grooves between panels
ball texture
ball material

Physics Talk p . 134 11/1/12

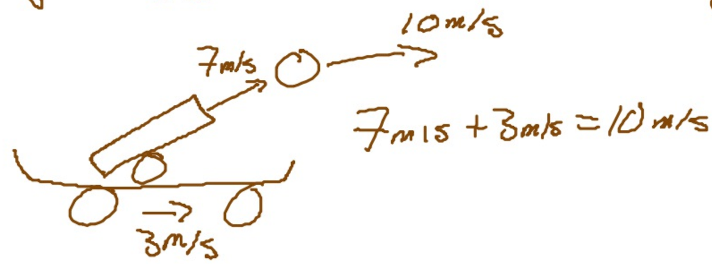
Galileo's Law of Inertia	an object at rest naturally stays at rest; a moving object naturally wants to keep moving
What causes objects to eventually stop?	an invisible force: friction
Which object has greater inertia?	more mass = more inertia
What kind of force is in N's 1st Law of M?	Unbalanced force
Unit of mass	1 kg = 1000 grams 1 kg ≈ 2.2 lb

What advantage from a running start?

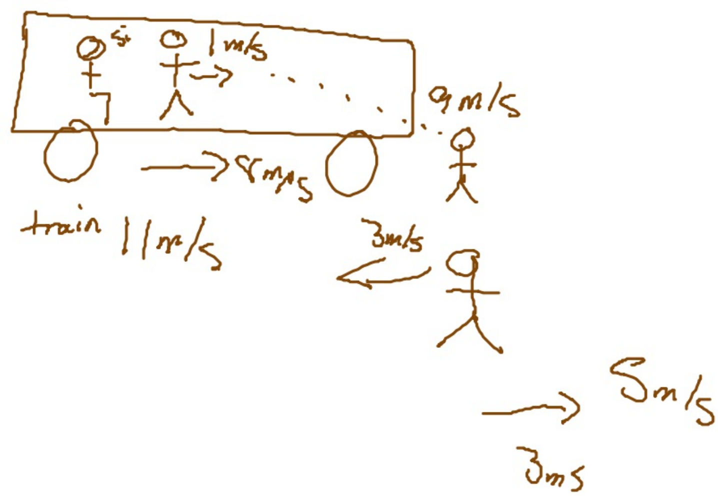
Your force forward is increased
Can be increased more with a throw

Calculating the speed of the javelin

$$v_j = v_{hand} + v_{elbow} + v_{shoulder} + v_{body}$$



frame of reference



Checking up 1,2,5,6

11/05/12

2:21-2:50

Checking Up p. 138 #1, 2, 5, 6

WDYTN? p. 141

EQ p. 142

PtG pp. 143-44 #1-4, 10

2:50-3:06

Ch. 2 Section 2 Constant Speed and Acceleration: Measuring Motion

WDYS & WDYT

2.2 Constant Speed and Acceleration: Measuring Motion 11/06/12
p. 145

WDYS Guy walking slowly (sleeping), close together footsteps
Lost a paper, dog walks at same pace, snail
Guy running, in Love w/ flowers, dog also running,
far apart footsteps, speed lines & trees blurred
from speed, energized

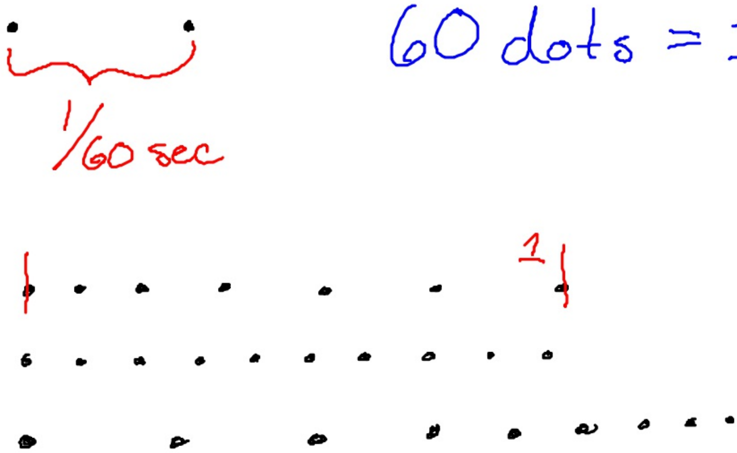
WDYT 100 mi/h (45 m/s)
If you drove for one hour, you would travel
100 miles.

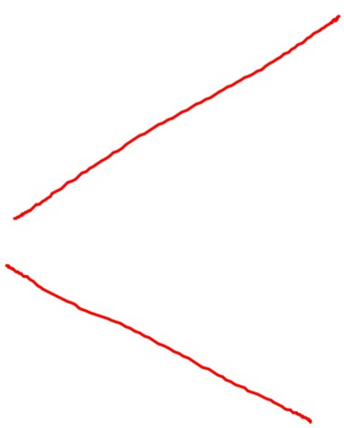
For every second you drive, you travel 45 meters.

$45\ m/s \approx 100\ mi/h$

Speed

60 dots = 1 sec





Group 1	Group 2	Group 3	Group 4
Rachelle	Gabby	Alexandra	Mia
Cinthia	Vicky	Marina	Azusena
Alejandra L.	Alejandra R.	Daisy	Sandra
Zuleima	Lindsay	Stacey	Shelby
Rubi	Izamar	Meghan	

Elizabeth

Physics Talk p. 148 11/8/12

acceleration	a change in speed or direction in a time interval
Constant speed	dots equally spread apart segments the same length zero acceleration
positive acceleration	dots get farther apart
negative acceleration	dots get closer together
instantaneous speed	right now speed
average speed	$\frac{\text{distance (m)}}{\text{time (s)}}$ $\frac{d_f - d_i}{t_f - t_i} =$ (with d_i and t_i crossed out and marked 0)

average velocity	$\frac{d_f - d_i}{t_f - t_i}$
acceleration	$\frac{v_f - v_i}{t_f - t_i}$ $\frac{(m/s)}{(s)}$ $m/s/s$ m/s^2
zero velocity	at rest, stop, complete stop standing still, at a standstill halt

11/8/12 & 11/13/12

Checking up p . 151 #1 -4

WDYTN p. 152

EQ p. 153

PtG p . 154-56 #2, 3, 7, 14

11/13/12 Plan

1:05-1:35 Section 2.2 questions (above)
1:35-1:55 Section 2.3 WDYS & WDYT
1:55-2:25 Section 2.3 Investigate

2.3 Newton's Second Law: Push or Pull p.157 11/13/12

WDYS positive acceleration

slow - whatever - not much movement, calm, not really bent, ball not moving

higher - a little bent (stick), a little faster

fast - OMG!!! - more bent, a lot faster

WDYT What is a force? a push or a pull

Tennis ball vs. bowling ball (same force)

speed - tennis ball faster

inertia - tennis ball less

acceleration - tennis ball greater

Longer to stop - bowling ball

11/13/12

Group 1	Group 2	Group 3	Group 4
Cinthia	Gabby	Alexandra	Mia
Alejandra L.	Vicky	Marina	Rachelle
Zuleima	Alejandra R.	Daisy	Sandra
Rubi	Lindsay	Stacey	Shelby
	Izamar	Meghan	

Azusena

Elizabeth

11/15/12

1:05-1:50 Section 3 Investigate

1:55-2:25 Physics Talk

Physics Talk p. 160

11/15/12

Newton's Second Law of Motion

mass ↑ acceleration ↓
with a constant force

The acceleration of an object is
- directly varies with the amount of force applied ↓f↑ a↑↓

and
- inverse variation with the object's mass ↓m↑ a↓↑

Force = mass × acceleration

$F = ma$

Force = Mass × acceleration

$$\frac{kg\,m}{s^2} = (kg)\left(\frac{m}{s^2}\right)$$

N ewton

$1\,N = 1\,kg\,m/s^2$

$$5(N) = .75(kg)\ a\left(\frac{m}{s^2}\right)$$

$$a = 6\tfrac{2}{3}\ \frac{m}{s^2}$$

$$\frac{5}{\frac{3}{4}} = \frac{5 \cdot 4}{3} = \frac{20}{3} = 6\tfrac{2}{3}$$

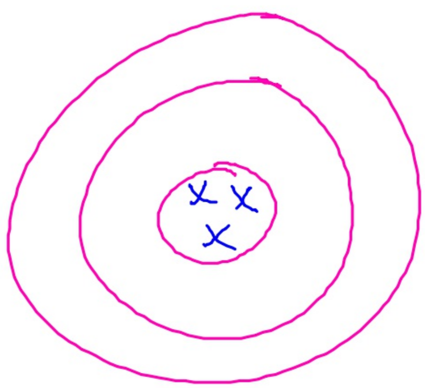
11/19/12

m = 100 (g) = 0.1 kg
F = 600 (N)
a = ?

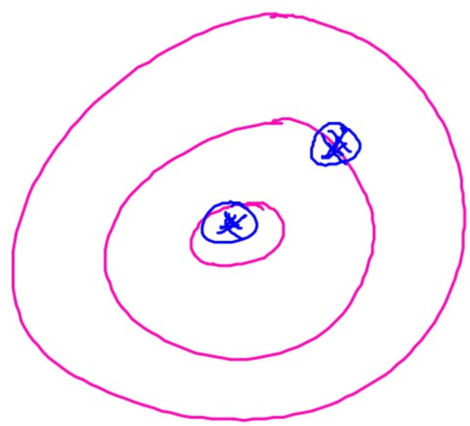
$$600\ \frac{kg\,m}{s^2} = .1\,kg\ a$$

$a = 6000\ m/s^2$

accuracy



precision



Significant Figures

p . 164

11/19/12

What are they?

Digits that represent the accuracy + precision of our data.

How do you know which to include?

The data that is least precise determines the number of SigFigs.

- All non-zero digits (1-9)
- A zero between non-zero digits 105
- A zero at the end of a decimal # 1.50
- A zero at the beginning of a decimal # is NOT significant 0.023
- In a large # without a decimal point, the zeros are NOT significant 3000

300

one SigFig

300.

three SigFig

Mass, Weight, Gravity	p. 166 11/20/12
(kg) Mass	how much stuff is in something Does <u>NOT</u> depend on location
(m/s^2) gravity	Acceleration (pull) – generated by mass, more mass = more gravity $9.8\ m/s^2 = g = a_g$
(N) Weight	Force exerted by your mass ↓ gravity <u>is</u> affected by distance

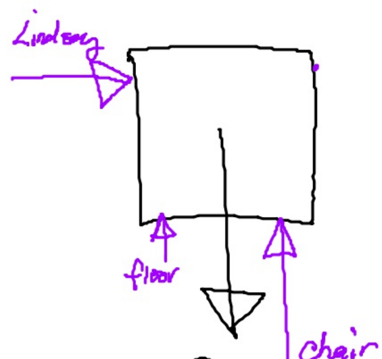
Free Body Diagram (FBD)

Representing forces

Forces

The bigger the arrow, the bigger the force.

point in the direction of the action of the force



Balanced forces have arrows of the same length.

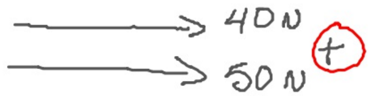
11/20/12

Checking Up p. 167 #1-4

WDYTN? p. 170

EQ p. 170

PtG p. 171-173 #3, 4, 10, 12, 15, 18



11/26/12

2:21-2:45 Complete the above questions for 2.3

2:45-3:06 2.4 Projectile Motion: WDYS, WDYT

2.4 Projectile Motion: Launching Things Into the Air p.174

11/26/12

WDYS Girl on stool throwing two apples in two different directions w/ boy keeping time (how long from when she released the apple until it hit the ground). More force put into the green apple (longer path), but red + green hit at the same time.

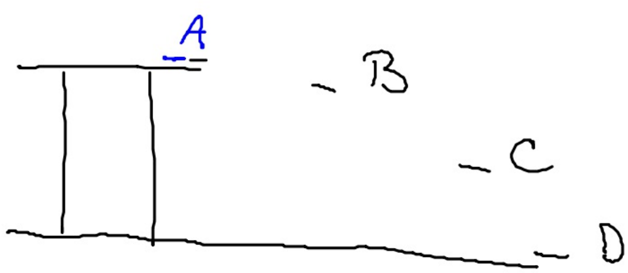
WDYT

Force / Energy applied
Mass / Weight
Wind
Height of object being thrown
Angle of throw

11/27/12

1:05-2:00 2.4 Investigate

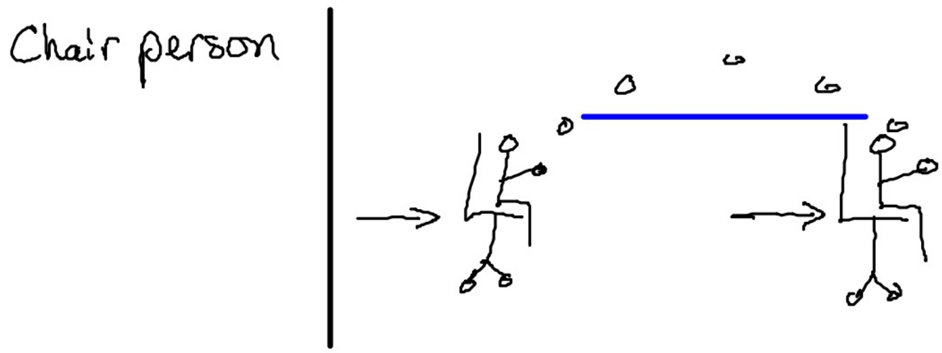
2:00-2:25 Physics Talk p. 177



Physics Talk

11/27/12

projectile	an object that is thrown or shot through air or another medium
projectile motion	the movement of a projectile
Forces	gravity, air resistance
F↑	increased horizontal motion, no change in time of fall
height	h↑ ↑ horizontal travel ↑ fall time h↓ ↓ fall time ↓ horizontal travel



Checking Up p.178 #l, 2, 3

WDYTN p.181

EQ p.181

PtG p . 182-183 #4, 5, 6, 11

11/29/12

1:05-1:45 2.4 questions listed above

1:45-2:00 2.5 WDYS, WDYT

2:00-2:25 2.5 Investigate #1 & 2

2.5 The Range of Projectiles: The Shot Put p.184 11/29/12

WDYS A girl kicked the ball vertically, it travelled in an arc, came down + hit the boy in the head, ricocheted off at a lesser angle, travelled in an arc and landed in the goal. Running dog, boy in back cheers "GOL!!" Goalie threw himself to the side to stop the ball travelling in an arc.

WDYT Changing Angles

Larger angle = steeper trajectory
shorter range

Smaller angle = longer range

 close to this for maximum range

More launch speed = longer distance (range)

12/03/12

2.5 Investigate p.184

Steps 1-2 Use Ticker Tape Timer

12/04/12

1:05-1:40 2.5 Investigate

Step 3: String/mass assembled already

Step 4: skip

Steps 5-9: Pushpins above north board

1:40-2:05 2.5 Physics Talk

2:05-2:25 2.5 Questions (screen after PT)

Physics Talk

12/04/12

TWO motions	vertical ↕ horizontal ↔
	gravity causes vertical motion during free fall.
	Speed of sound = Mach 1
trajectory	path of a projectile
	Launch is controlled, but the flight is not.
	always a parabola

Checking Up p.189 #1-3
WDYTN p. 192
EQ p. 193
PtG pp. 194-195 #1-4, 6, 8

12/06/12

1:05-1:10 "Fearless Felix" Video
1:10-1:45 Finish section 2.5 questions
1:45-2:25 Mini-challenge

Chapter 2 Mini-challenge pp. 196-197

2.6 Newton's Third Law: Run and Jump p.198 12/10/12

WDYS When he pushes on the wall it pushes away from him, but curves back towards him when he moves away (like elastic).
He generated a breeze when he moved back.
Because of the point of reference, the guy on the skateboard looks like he's moving faster (p.2)

WDYT
1) Bend your knees.
2) Push your feet against the ground.
3) Lean forward on your toes.
4) Extend your legs with a strong force
5) Force must go through your feet to the floor.

12/11/12

1:05-2:20 2.6 Investigate #2-end

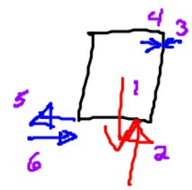
12/13/12

1:05-1:40 2.6 Physics Talk
2:10-2:25 2.6 Questions

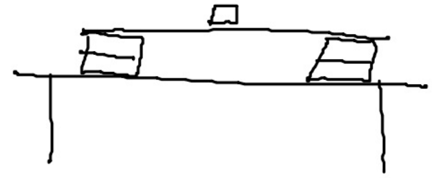
Physics Talk p . 201 12/13/12

opposing forces	push of student against the wall push of the wall against the student
Size of the force	wall's push the <u>same</u> as student push
Newton's 3RD Law	• Forces come in pairs, • Forces are equal in size, • Forces are opposite each other

Free Body Diagram



1) gravity
2) ground
3) air
4) body
5) feet
6) ground



Newton's 3RD Law

All forces come in pairs which are equal and opposite

Section 2.6

Checking Up p. 205 #1-3

Active Physics Plus p. 206 #1

WDYTN p. 207

EQ p. 207

PtG p. 208 #2-4, 8

2.7 Frictional Forces: The Mu of the Shoe p.210

WDYS

WDYT

Physics Talk

2.8 Potential and Kinetic Energy: Energy in the Pole Vault p.220

WDYS

WDYT

Physics Talk

2.9 Conservation of Energy: Defy Gravity p.234

WDYS

WDYT

Physics Talk